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WELL DEVELOPMENTS

BOARD MEMBERS
John Arrigo, DEQ Member
Bob Bergantino, MBMG Member
Pat Byrne, Industry Member
Kevin Haggerty, Industry Member
Laurence Siroky, DNRC Member

No. 19 BOARD OF WATER WELL CONTRACTORS November 1997

---- Board of Water Well Contractors ----

Left to right: Bob Rudio, program manager; Kevin Haggerty, industry member; Pat Bryne, industry member; Bob Bergantino, MBMG member; John Arrigo, DEQ member; Pat Boggess, secretary. Not pictured: Laurence Siroky, DNRC member.

APPOINTMENT TO THE BOARD

Governor Mark Racicot has appointed Kevin Haggerty of Bozeman for a three-year term on the BWWC, to succeed Wes Lindsay. Kevin has been a licensed water well contractor since November 1978. His family has been in the building and contracting business in the Bozeman area for decades. He will represent the drilling industry on the BWWC, as a driller member.

HISTORICAL BOARD MEETINGS

The twenty-sixth meeting of the Water Well Contractors Examining Board was held on June 5, 1969, in the Board of Health Building, Helena, Montana. Mr. Ernest Bond, a hydrologist-advisor to the board, was working on a manual for well drillers. The board decided to have Mr. Bond and Mr. Lindsay rewrite the drillers' examination. Mr. Wesley Lindsay was appointed to the board by Governor Forrest Anderson, replacing Mr. Osborne. Mr. Bond suggested that we have two or three examinations available. Mr. Lindsay said he thought there should be more questions on construction and safety and not so many on drilling equipment. Mr. Brinck was reelected chairman, and Mr. Lindsay was unanimously elected vice-chairman.

REMEMBERING WES LINDSAY

Wesley Lindsay, long-time member of the Board of Water Well Contractors (BWWC), passed away in Helena on November 5, 1997. Wes had just retired from the BWWC in July, after serving nearly 30 years.

Wes began his water well career in the late 1950s in business as Price and Lindsay Drilling. He was first licensed on December 4, 1962, and appointed by Governor Forrest Anderson to the board in June 1968. From 1969 to 1983, Wes was instrumental in developing rules for well construction in response to legislative amendments. Wes began serving as chairman of the BWWC in 1974. In 1983, as chairman of the board, Wes guided legislative, ad hoc, and drilling association committees in developing specific rules for mandatory water well construction, which culminated in 1987 with the first complete set of water well construction standards. During the period of 1993 to 1997, Wes presided over changes in the rules to clarify well construction standards.

Wes often stated that the rules should encourage the orderly development of Montana's groundwater resources with maximum protection for the public and minimum interference by government.

Wes made a significant contribution to the state during his many years of service. He will be missed.

Wes Lindsay — 1997

CONTINUING EDUCATION

The Montana Environmental Training Center (METC) is offering several classes this winter that have been approved for continuing education. Even though some classes might not be associated directly with water well or monitoring well construction, some licensees may wish to attend these classes and can get continuing education credit by attending.

January 7, 1998	Dealing with Coliforms Helena
January 27-28, 1998	Surface Water Treatment Butte
February 4-5, 1998	Emergency Planning Kalispell
February 25-26, 1998	Small Water and Wastewater Systems Helena

Additional classes may be available from the METC in December, January, February, and March. To register or get further information, call (406) 454-2728 and ask for Jan or Barb.

NEW LICENSEES

The BWWC welcomes these new licensees:

Water Well Contractors

Guy Davis
Cameron Decker
Dennis Dixon
Miles Erickson
Mike Iba
Stan Ortel
Tom Richardson
Rich Scrivner
Mark Smith
Ralph Tiemeyer
Dan Westberg
JohnWheeler, Sr.
Mike Wolf

Monitoring Well Constructors

Wendell Hawley
Chad Lee
James Potts
Joe Von Stein

Water Well Drillers

Ladessa Croucher
Mike Downey
Randall Edmission
Steven Hickel
Don Maxwell
Casey Olson
Clay Parsons
Frank Pershern
Ed Shindall
Britt Stevens

WELL ABANDONMENT

The well abandonment issue has done more to influence rule making by the BWWC than any other single issue. It appears to be a simple and straightforward subject. Obviously, wells can't be left open for kids to fall into, or for any contamination to enter the well and, eventually, the groundwater system. Common sense tells us that these wells should be appropriately sealed to prevent a public safety problem.

In 1984, the rules committee of the BWWC began to draft comprehensive rules for well construction and ran into more questions than answers regarding well abandonment. For instance:

- How do you define a dry well or an inadequate well?
  - Who owns the well as it is being drilled?
  - Who decides that it is inadequate?
  - Does "proper abandonment" mean complete plugging of the well or temporary capping of the well?
  - What types of wells require abandonment?
  - Are they permanently discontinued wells or wells that are in disrepair?
  - Are they wells that are unusable because of driller error?
  - Are they perfectly well constructed wells that the owner doesn't use and may not want to abandon?
  - Are they flowing wells?
  - Are they dry wells or inadequate wells?
  - Can the abandonment be temporary?
  - Does casing need to be removed during abandonment?

- Can the BWWC order a well to be permanently abandoned?
  - Should the procedure be the same for monitoring wells?

- How long can a monitoring well be left before it is considered to be abandoned?

- Can the BWWC use bond forfeiture to abandon wells properly?

- How many wells that are not properly abandoned are in Montana?

- What about large diameter wells or old wells that were hand dug?
  - Is a variance required for these wells?

These questions as well as others led to some basic changes in the rules.

1. The BWWC needed authority to order not only proper abandonment of a well, but also to order repair of <u>any</u> faulty well.

2. The BWWC did not have authority to order a <u>well owner</u> to abandon a well properly. The authority for this rests with the Department of Natural Resources and Conservation under MCA 85-2-505 and under specific conditions unrelated to water well construction rules. Further, the Department of Environmental Quality (DEQ) also has broad authority for dealing with well owners regarding any potential contamination of aquifers.

3. Flowing wells needed to be treated in a special manner regarding abandonment and also could require a variance in well construction standards.

Dry or inadequate wells needed a temporary abandonment procedure if the intent is to drill deeper.

It became apparent to the 1984 rules committee that all of these considerations could not be clearly put into definite rules that would satisfy all of the questions that were raised. It was also during this time that in Midland, Texas, a child fell into an open well, and the rescue brought nationwide attention to this subject.

In 1989, the Board of Natural Resources and Conservation (now defunct through reorganization) asked the BWWC for information on how many wells in Montana were not properly abandoned and what it would cost to abandon them. Data that were available surprisingly indicated that there could be 5,000 to 10,000 wells in Montana that needed this attention. Further, the costs to abandon (plug) a well properly were estimated in 1990 by average depths, diameters, methods, and sealants to exceed $500 per well. Clearly, substantial funding would be required if there were indeed 10,000 wells that needed proper abandonment.

In 1990, the Montana Bureau of Mines and Geology (MBMG) provided the DNRC with some statistical data on un-abandoned wells along with observations that this problem posed a significant threat to aquifers throughout Montana. Efforts were made to require increased driller fees to be used for abandonment, but failed largely because it was estimated that driller license renewal fees would have to increase from $125 per year to about $400-$500 per year. Funding to abandon wells has not been proposed again.

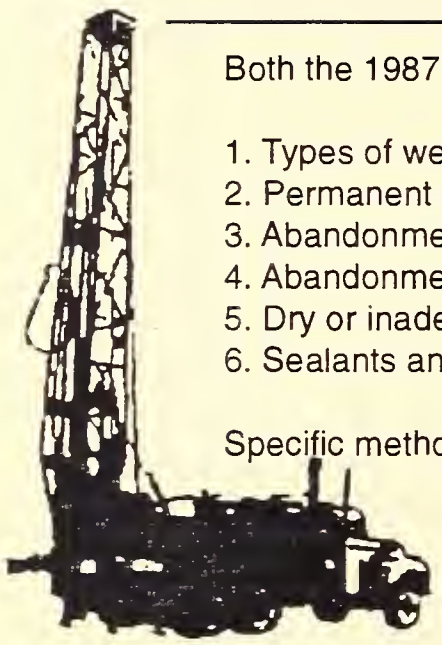
In 1997, the *Water Well Journal* published an article entitled "Economics of Drill Hole Plugging and Abandonment" by John Wheaton, MBMG, and Steve Regele, DEQ. Table 1 of their paper is shown here to give you a better picture of the costs involved with different sealing methods.

TABLE 1.
Economic Considerations of Grouting

	Bentonite Chips	Low Grade Bentonite Chips	Bentonite One-Bag Slurry	Bentonite Granules (10-lb Slurry)	Bentonite Powder (9-lb Slurry)	75% Gravel plus 25% Bentonite	Neat Cement	Cement plus 8% Bentonite
Cost Unit Size	$4.35 50-lb bag	$40.00 1 ton	$10.28 50-lb bag	$7.42 50-lb bag	$8.53 50-lb bag	$6.00 50-lb bag	$6.89 94-lb bag	$6.89 94-lb bag
Quantity linear ft (6" hole)	1 bag/ 3 lin ft	50 lbs/ 3 lin ft	1.5 gals/ 3 lin ft	1.5 gals/ 1 lin ft	1.5 gals/ 1 lin ft	1 bag/ 3 lin ft	1.5 gals/ 1 lin ft	1.5 gals/ 1 lin ft
Labor Cost*	1 person @ $10.00/hr	1 person @ $10.00/hr	$0.00*	$0.00*	$0.00*	1 person @ $10.00/hr	$0.00*	$0.00*
Pumping Rig Cost*	$0.00*	$0.00*	$200.00/hr	$200.00/hr	$200.00/hr	$0.00*	$200.00/hr	$200.00/hr
Dry Material cement needed lbs/500' x 6" hole	7700 lbs (154 bags)	8000 lbs (4 tons)	1440 lbs (29 bags)	1500 lbs (30 bags)	1100 lbs (22 bags)	7700 lbs (154 bags)	8500 lbs (91 bags)	49 lbs (52 bags)/ 200 lbs bentonite (4 bags)
Slurry material produced units/ 500' x 6" hole	N/A	N/A	750 gals	750 gals	750 gals	N/A	750 gals	750 gals
Mixing ratio bentonite (lb/gal)	N/A	N/A	50/24 gals	50/25 gals	50/35 gals	N/A	94/5.2 gals	1200 lbs cement/100 lbs bentonite
Truck rental (5 yd cap)	$0.00	$150.00/day	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Truck rental (1 yd cap)	$65.00/day	$0.00	$0.00	$0.00	$0.00	$65.00/day	$0.00	$0.00
Plugging time/ 500-ft hole	6 hrs	6 hrs	3 hrs	6 hrs	6 hrs	6 hrs	6 hrs	6 hrs
Total plugging price (500-ft hole)**	$794.90	$370.00	$900.00	$1422.60	$1387.66	$1049.00	$1804.24	$1587.28

* Where drill rigs are used, labor is included.
** In a commercial size operation, additional costs include but may not be limited to mine permitting, mining, and reclamation.

Editor's Note: Costs noted were those the authors determined to be available in 1996 in Billings, Montana. They are not a suggested current price. Determine your own available price, which may be higher or lower than those listed here.



Both the 1987 and 1991 rule changes by the BWWC dealt with:

1. Types of wells requiring abandonment - 36.21.669A
2. Permanent abandonment - 36.21.670
3. Abandonment of flowing wells - 36.21.671
4. Abandonment of filter pack wells - 36.21.672
5. Dry or inadequate well holes - 36.21.679
6. Sealants and placement - 36.21.673 through 678

Specific methods for abandonment are explained in these rules.

Basically, the BWWC requires a well driller to properly abandon a well that is unusable because of driller error. The well owner is responsible for all other conditions requiring abandonment. Further, with a dry well or an inadequate well, it is required that the well driller weld a 1/4" steel plate over the casing, providing a watertight seal, if the well is not going to be properly abandoned (plugged).

Consideration of the questions posed by the abandonment issue played a very important role in the BWWC's rule making. Variance procedures were adopted. Temporary abandonment of dry wells was adopted. A flowing well abandonment procedure was developed. A clarification of authority for disciplinary action was finally adopted by the legislature. Most importantly, the legal issue of responsibility was clarified by requiring proper abandonment by the driller only in the event of driller error. Unfortunately, the issue of historical unabandoned wells that pose a potential threat to Montana's aquifers has yet to be resolved.

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